

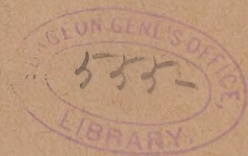
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THE
Dietetic Treatment
OF
Typhoid Fever

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THE DIETETIC TREATMENT OF TYPHOID FEVER.

THE inherent gravity of the disease, its long duration, the peculiar manner in which it affects the digestive system, and the varying behavior of its microbe under different forms of nutrition, all give to dietetic treatment in typhoid fever an importance which it has in no other connection.

Typhoid fever is an infectious disease, due, as is now generally accepted, to the action of the Koch-Eberth bacillus; its pathology is inseparably connected with the entrance and action of that microbe; its symptoms are a direct consequence of the ptomaine or ptomaines which it produces. The three clinical periods, each of one week's duration, correspond pretty closely to the different phases of intestinal disease, the infiltration, the softening or sloughing, and the ulceration of the

solitary and agminated follicles of the intestine; and these are followed by a period of repair which is not usually complete until after the convalescence has become well established. The severity of the symptoms usually, but not always, coincides with the extent of intestinal lesions, and these vary from so slight an inflammation as to be little more than perceptible on autopsy, the infiltration involving only the mucous membrane, to an engorgement of the entire thickness of the intestine, with consequent almost complete closure of its lumen. In even the milder cases, however, there is œdema of the intestinal walls beneath the follicles and for some distance about them, enfeebling their power of resistance, and consequently increasing the danger of rupture.

But the lesions of typhoid fever are by no means limited to the intestine. There is in fact scarcely an organ in the body which does not to some degree suffer as a part of the disease. But for present purposes, the changes in the alimentary canal are alone of interest. We find here, aside from the follicular disease referred to, that there is cloudy swelling of the epithelium, with often marked fatty degeneration. This degenerative

process is probably due not less to the general condition of malnutrition than to the pyrexia, to which it is often referred. As a result of it, there is a diminution of the functional activity of these organs. The digestive juices are secreted in less than normal quantity and with modified constituents. Digestion is therefore impaired, and in this disturbance we have one of the most important barriers to the dietetic treatment of the fever patient. Along with all this we have a faulty elimination of waste products, and thus the system becomes poisoned with excrementitious matters. In constructing the dietary of fever, therefore, we have to bear in mind the peculiar lesions of the disease, the condition of the digestive organs, and the tendency to retention of effete products. We must also endeavor to meet the requirements for food.

The demand of the organism for nourishment is great from the beginning to the end of the disease. Fever implies waste. It has been estimated that the fever patient loses weight at the rate of 239 grams (Layton), or about half a pound per diem. To fully meet this demand would signify the administration of a much more abundant as

well as a more nutritious diet than is required in health. But the very process which increases the demand for food renders the alimentary canal entirely unable to dispose of anything like an adequate amount of it. It has been aptly said that "fever closely resembles muscular effort in its arrest of the digestive functions, at the same moment that it makes an urgent demand for nutriment. With ultra-Egyptian rigor, while straw is withheld, 'the tale of the bricks is doubled.'" Experience taught the fact that the digestive powers were crippled long before scientific investigations had been made. Graves, who first fed fevers, was exact in his limitation as well of the amount as of the character of food permissible. But when Beaumont observed the appearance of the stomach in the pyrexial state, he concluded that fever completely arrested the digestive process. Since that time opinions have oscillated between the extremes of overfeeding and starvation.

At present most writers agree that the diet of the typhoid patient should be of fluid character, and almost exclusively limited to milk. It is known that the demand for water is enormous. Nothing is more essential to the management of

the case than the administration of an abundance of pure water. It increases nutrition, and by augmenting the secretions, reduces the temperature and assists in the elimination of the toxic products of waste. These objects it accomplishes, in the first place by holding the soluble constituents of the food in solution and conveying them to the tissues ; and in the second place by favoring, in its abundance, the to and fro process of nutrition. Yet water must not be given indiscriminately either in regard to quantity or time of administration, for it then diminishes the desire for more nutritious food, and is very apt to produce vomiting.

Clinical experience has established for us the milk diet ; but its value in the febrile state has been called in question. One of the most sweeping objections that have been made against it is that of Dujardin-Beaumetz, who considers it of value only for the water and salts which it contains. He says : " One of the first consequences of fever is a diminution of the digestion secretions, or even a chemical change in their composition. The digestive apparatus is diseased and the intestinal juices are diminished. The peptonization of

albumen and the emulsification of fats is not properly performed. Fever patients invariably lose weight, the loss taking place through the excretory organs, the lungs, intestines, kidneys, and skin. As the resorption of anything but liquids and fats is almost *nil*, the first rule must be to give fever patients nothing but liquids. Milk and bouillon are most available. The water and salts undergo a ready absorption. The fate of the albuminoids and fat contained in the milk has not yet been determined; it is probable that they are little if at all used." This view seems more extreme than we are warranted to accept; for it is only in the most severe cases of typhoid fever that the intestinal inflammation extends far beyond the region of agminated follicles in a degree sufficient to render it at all likely that absorption is arrested. And we have, on the contrary, abundant evidence that fluids, simple and medicated, are absorbed both from the stomach and from the small intestine, on the one hand in the effect produced, and on the other hand in the character of the medication—articles soluble in an acid or only in an alkaline medium. The difficulty appears to lie rather in the faulty preparation of food for absorp-

tion. The digestive powers are, as we have seen, diminished, and probably about to an extent proportionate to the degree of pyrexia and the severity of the symptoms.

But other influences frequently operate to reduce the digestibility of milk. One of these influences is its own tendency to coagulate into huge masses under the influence of the stomach rennet. The addition of lime water, seltzer, etc., to the milk diminishes this tendency only at the expense of the acidity of the gastric juice, which is already subnormal in amount. A small quantity of table salt added seems to act almost as well, and it is asserted that barley water, malt-sugar, and mucilaginous substances produce the same effect.

Another error is the too general use of cold drinks. Some practitioners administer nothing, not even milk, without ice. There is no way so sure to further cripple the already feeble digestion than this. I do not believe, therefore, that efforts to reduce the temperature of the patient by means of cold baths applied to the gastric mucous membrane are justifiable. The value of frequent draughts of cold water is not so much in their local effect as in their action on the cutaneous

and pulmonary exhalations, and this action is obtained as well by fluids of moderately low temperature.

But probably the greatest blunder that is committed is the too frequent administration of food and drink. Some prominent authorities direct the administration of milk, water, wine, or whiskey, at intervals varying from every ten minutes to every half hour. It has been my experience that every instance in which the stomach rejects food, unless due to constipation, or cerebral or renal complication, can be traced to overfeeding. It is strange that a common experience in practice among children should be so entirely disregarded when dealing with adults, and that what would nauseate a robust individual is forced upon the fever patient. If water and other liquids be given at intervals of an hour and milk only every three hours, each can be administered in greater quantity with impunity, and ample time for digestion will be afforded. And, what is just as important, the patient is permitted to take the rest his beclouded intellect demands.

The best guide to the quantity of milk that is to be administered lies in the observance of the effect

produced. The stools should be regularly inspected for undigested caseine, the evidence of overfeeding. Meteorism or abdominal pain from indigestion should be responded to by a diminution of food. Ordinarily from three to four pints of milk are required in twenty-four hours.

But the exclusive milk diet is open to another and more serious objection. We all know that milk as a diet contains all the five great articles of food—the proteid, caseine; the carbohydrate, sugar; the fat, butter; salts and water; and these ingredients are arranged in the proportions required for the maintenance of the young of the species. Being at the period of their most rapid growth, the young require a relatively greater amount of albuminoid matter than is required in adult life, and but very little of the carbohydrates. We find therefore that milk, for the nutrition of the adult, is relatively deficient in carbohydrates. We have seen that the effect of fever is like that of muscular exercise—that it creates an extraordinary demand for food. And thus the deficiency of carbohydrates becomes a more important defect in the dietary of fever than it is in that of health. It is a remarkable fact that efforts to improve upon

the milk diet in fever have been almost entirely confined to the administration of such articles of uncertain nutritive value as beef tea, beef extracts, and the so-called peptones, all of them proteids, if anything. And I dare say that every one has observed that these preparations, if retained by the stomach, act more or less perniciously by increasing the diarrhœa, if not the pyrexia, phenomena for which Dr. Rachford has given us an explanation—that ptomaines developed by bacilli fed upon the so-called beef peptones act more severely upon the nervous system than do those developed by bacilli fed upon milk. But well-skimmed and well-seasoned broths, not too often given, are agreeable to the patient, and, being little more than saline solutions, practically free from proteids, are useful for the salts and water which they contain.

A mixed diet has generally been considered out of the question in typhoid fever on the ground that vegetables and carbohydrates add to the dangers of intestinal fermentation and increase the bulk of solid fæces. And so great has become the dread of this accident, in itself dreadful and to be avoided by every available precaution, that it has become a perfect bugbear to the intelligent study

of dietetic treatment. I firmly believe that many cases of typhoid fever are permitted to die of inanition through fear of this accident ; and I also believe that the danger of intestinal perforation is as much favored by malnutrition with its tendency to degenerative changes in the tissues as it would be by a proper administration of a mixed diet comprising milk and carbohydrates. The proper way to administer carbohydrates is in a predigested form ; and their artificial digestion yields a much more definite and simpler product than does that of proteids. In this belief I have used Mellin's Food, and have been well pleased with the result in the typhoid fever as well of adults as of children. Consisting of predigested carbohydrates, ready, when dissolved, for immediate absorption from the stomach, it greatly enhances the nutrition of the patient and retards destructive metabolism, which, if unrestrained, results in anæmia and emaciation, and this it accomplishes without increasing the dangers of the disease. Added to milk, it prevents its too firm coagulation, and thus assists in its digestion. I have used it in nearly every case that I have treated, in hospital and out, for more than a year, and have found it generally acceptable

to the patient, as it affords relief from the monotony of an exclusive milk diet, and I have had no evil results from it.

Alcohol is one of the most valuable articles of food which we possess. Whiskey, brandy, and champagne are the best forms for its administration. The only question with which I desire to deal is the time at which to begin its administration; for, although it is possible to drag many a case through the disease without it, there is no good argument in favor of its omission. Many practitioners delay its administration until alcohol is actually demanded by beginning heart failure; and until recently I followed their example, permitting some cases to pass nearly or quite to convalescence without the use of it. I am satisfied, however, that it is more judicious not to withhold it longer than till the beginning of the second week of fever. A half ounce of whiskey given three or four times a day from this time on will frequently obviate the necessity of resorting to it in hourly doses at a later period.

My object, then, in presenting this paper is a plea for the more abundant nourishment of the typhoid patient, and withal a more rational man-

agement of his dietary than is generally practised, believing that there is no other way in which we can so surely obviate the dangers of the disease as by maintaining to the highest degree possible the nutrition of the patient.

